Dr. Easton's extraordinary career. Born in Bradford, Pennsylvania, he earned his B.S. at Penn State but soon thereafter left for Texas A&M University, where he acquired both his M.S. and the apt sobriquet "Slim" (which he fosters to this day). Then on to Oregon State, where this writer first met him wrestling with an impossible full-time teaching schedule and pursuing, with passion bordering on obstinacy, his professional focus: ectoparasites. Slim's scientific exploits while in Oregon have duly passed into legend. A real-life Indiana Jones of entomology, he would hurl himself from the merest dinghy onto Oregon's awesome coastal cliffs, scaling these for the sole purpose of collecting lice, fleas, flies and acarines from resident sea birds (1970, J. Med. Ent. 7:438–445). On the opposite side of the state, well past midnight, he could be found scouring the back roads of the badlands, ever vigilant for pocket mice, kangaroo rats, and their arthropod associates. Award of the doctorate only fueled his wanderlust. He immediately left for Tanzania, where he spent the better part of five years as an animal health officer, often under inimical conditions. With the fortitude of a Voortrekker, he sought out and rediscovered *Nuttalliella namaqua* (Nuttalliellidae), the so-called missing link between argasid and ixodid ticks and a species known from only 13 specimens since its description by Bedford in 1931 (Parasitology 23:230–232). This achievement, more than any other, established Easton's reputation as an indefatigable field entomologist. Perhaps out of breath, he chose to spend the next 12 years as an Associate Professor at South Dakota State University, but when that institution's Plant Science Department summarily folded, Slim armed himself with a Fulbright scholarship, spun the globe, and found his finger pointing at Port Moresby and the University of Papua New Guinea. There he continued his ectoparasitological investigations, despite increasingly ominous sociopolitical rumblings, before settling at last amid the comparative comforts of Macau. During two decades of turbulence, he had somehow also found time to publish over 100 scientific papers and reports.

In the last five years, Slim Easton has prepared about a dozen manuscripts on Macau's natural history. But what of the future? Sometime in late 1999 the Portuguese flag will be lowered forever along the Avenida de Almeida Ribeiro, and Macau's fate will join with that of the People's Republic of China. To their lasting credit, the Portuguese have accorded virtually all native Macanese (some 400,000 souls) the right to return with them to the land of Dom Enrique and Vasco da Gama. Might there also be room for one productive expatriate American? Those who know him will hardly be surprised if "Old Slim" succeeds in trading Taipa for the Tagus. *Boa sorte, meu colega! Boa viagem!—Richard G. Robbins, Armed Forces Pest Management Board, Walter Reed Army Medical Center, Washington, D.C. 20307.*

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Proceedings of the Second International Congress of Dipterology.—L. Weisman, I. Országh and A. C. Pont (eds.). SPB Academic Publishing, The Hague, Netherlands. 1991. 367 pp. cloth. $82.

Considering that the Diptera are one of the largest and economically and medically most important orders of insects, and that many entomologists study their biology

and systematics, it may come as a surprise that there is not a long history of "International Congresses of Dipterology." Indeed, until today only two such meetings were organized.* Both were held in eastern European countries with the last one taking place in Bratislava in 1990. More than 270 dipterists presented their research in numerous talks and on a fair number of posters. If the quality of the selected papers in this volume is any indication for the quality of Diptera research, I am looking forward to attending many more meetings. I was generally impressed by the ability of most authors of the research, as well as the review papers, to summarize efficiently their findings and yet at the same time to present an overview of the relevant literature.

Being a systematist, I was initially reluctant to read any of the applied entomology papers. However, as a reviewer I felt obliged at least to get an impression. I ended up reading almost all papers in the book. As expected, some were much less rewarding than others but, overall, the quality was excellent. There is a very definite trend within applied entomology to avoid using large quantities of pesticides. There appear to be rather different strategies for the control of blood sucking and phytophagous Diptera. For blood-sucking flies various strains of *Bacillus thuringiensis* and *sphaericus* are both cost-effective and efficient. A number of case studies are described in Becker's paper. However, it was disconcerting to learn that *Culicoides* defies such strategies because of the "lack of any parasporal inclusion activation in the larval midgut" (Kremer et al.). Maybe traps supplied with octenol and carbon dioxide will be useful for the control of *Culicoides* as it apparently is for many nematoceran bloodsuckers (Becker, Kline). Sometimes I was intrigued only by details. Who would have guessed that 83,000 to 163,000 tabanids would have to be interrupted during feeding and afterwards feed on another human being before a single case of transmission of the AIDS virus would be likely? As little as 10 nl of blood remains in the mouthparts of tabanids disturbed during feeding (Anderson).

For phytophagous Diptera authors feel that some pesticide use is inevitable and their efforts are concentrated on reducing the amount of chemicals used (Finch). They are either deployed more specifically to the target organ of the dipteran attack or the "pest" species is repelled from the host by using species specific deterrents (e.g., some oviposition deterrents produced by tephritids themselves or plant compounds (Kline)) or resistant strains of the host (Finch).

There were also a good number of interesting systematics papers. Some revolved around the various hypotheses regarding homologies of the sclerites found in male terminalia. Wood's clearly reasoned analysis of the homologies of the male terminalia will hopefully set standards for some time to come. Even if one were to disagree with his modified "epandrial hypothesis," one would hope that conflicting views are presented in a similarly cogent style. The manuscript certainly benefitted tremendously from Idema's excellent illustrations whose color codings made it easy to identify putatively homologous structures across taxa. Wood's paper is a must for all Diptera systematists interested in higher level relationships. Griffiths, a proponent of the "periandrial hypothesis," summarized the current knowledge of homologies of the muscles found in male terminalia. Unfortunately, it was very difficult to follow

* The publication of this review was delayed until after the summer of 1994, when a Third Congress for Dipterology took place in Guelph, Canada.

his discussion without consulting the primary literature for illustrations. No figures were provided.

While the contributions of Wood and Griffiths addressed problems of the higher level relationships among Diptera, Grimaldi presented a summary of his results of a phylogenetic analysis of the Drosophilidae based on 167 species and 217 characters. For some time to come, his cladistic analysis will set standards for any work on the drosophilids and replace Throckmorton's and Okada's hypotheses that were either based on intuition or phenetic techniques. Not surprisingly, the analysis found that *Drosophila* is paraphyletic unless a number of subgenera are sunk. Also of particular importance was the finding that all Hawaiian *Drosophila* species (now belonging to the genus *Idiomyia*) form a monophyletic group which is presumably much older than the Hawaiian islands that are currently above sealevel. These results will have a profound impact on studies of the adaptive radiation of Hawaiian fruit flies.

Two additional systematics papers (Marshall, von Tschirnhaus) demonstrated that as soon as Neotropical species are studied the geographic distribution of genera may change dramatically. Marshall found that a genus of Sphaeroceridae (*Sclerocoelus*) that was primarily known from the Nearctic was in fact mainly Neotropical. On one field trip von Tschirnhaus discovered 20 new species in a fairly small genus of agromyzids at one site in Peru (*Phytobia*) and suddenly 33% of all species were neotropical. Also quite interesting was von Tschirnhaus's account of how electrolytes on washing lines attracted a large number of males of agromyzid species at that Peruvian collecting site. Most species turned out to be undescribed and one can only wonder whether they may have come from the canopy where agromyzids, hitherto considered to be a cold climate loving family, may be rather diverse.

A common theme in a number of the systematics papers (e.g., Grimaldi, Mathis) was a critique of faunal studies. All too often such studies are bound to create synonyms and their contribution to the understanding of Diptera systematics is very limited. This point is well illustrated by the few faunistic papers published in this volume. They were among the least interesting contributions because species lists alone are not very informative.

If there was anything resembling a common concern expressed throughout the whole volume, it was certainly that there is a lack of recent comprehensive systematic studies. Our knowledge of Diptera is extremely limited, with not even the taxa that are notorious for their medical and economic importance having seen modern revisions. Thus, applied entomologists as well as ecologists face the same problems. Be it that Hövemeyer was unable to evaluate the catches of his emergence traps because the species could not be identified or White's finding that much money and effort had been wasted on trying to control a composite weed using the wrong species of tephritids belonging to a sibling species complex. Considering that in Germany up to 50% of the dipteran species are considered endangered (Vogel) without making it onto the red lists of endangered species, not much time remains to study the diversity of many geographic areas.

Similarly common was a quest for more work on larvae. Several authors pointed out that from an ecological point of view larvae are the more important life stage of many Diptera (Hövemeyer, Zuska) and the adults are little more than the conspicuous flying ovaries and testes. Applied entomologists (White) expressed interest in being able to recognize the immature stages for an early identification of pest species as well as for the control of imported plant material. Systematists were obviously in-

terested in having an independent (Krivosheina) data set to test their phylogenetic hypotheses.

The format of the book is dissatisfactory. For example, apparently there was no agreement on whether an abstract should be provided at all and, if so, where it should be placed. The book is not organized by subject matter. Instead the papers appear in the alphabetical order of the authors' names. The quality of the printing is surprisingly uneven. Idema's color coded plates are very competently reproduced (however, rumors have it that they were printed in Canada). On the other hand the book was printed using photo offset and a more attractive font would have made quite a difference. The quality of the paper is rather poor and the photos and some text on pages adjacent to illustrations are printed on a different kind. Considering the very high price of $82, more attention should have been paid to editorial details and the layout.—*Rudolf Meier, Department of Entomology, Comstock Hall, Cornell University, Ithaca, New York 14853, USA and Institut für Zoologie, FU Berlin, AG Evolutionsbiologie, Königin-Luise-Str. 1-3, 14195 Berlin, GERMANY.*

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Nymphs of North American Stonefly Genera (Plecoptera).—Kenneth W. Stewart and Bill P. Stark with illustrations by Jean A. Stanger. 1988. Thomas Say Foundation, v. 12. University of North Texas Press, Denton, Texas. xiii + 460 pp. $35.50 paper.

Some 57 years after the publication of Claassen's (1931) "Plecoptera Nymphs of North America (North of Mexico)," the subject is updated with Stewart and Stark's "Nymphs of the North American Stonefly." With this recent study, which includes literature published through 1987, the total number of North American Plecoptera is elevated from 21 to 99. In terms of content, purpose, and style, Stewart and Stark's book is reminiscent of Wiggins' elegant book on the genera of North American caddisfly larvae (1977). Stewart and Stark, however, present more extensive and comprehensive information especially on the subjects of ecology, behavior and life cycles.

The introductory chapters of this book include sections on classification and phylogeny, biogeography, nymph ecology and behavior, morphology, and adaptation. The phylogeny section lists several competing phylogenies of stoneflies, but mainly discusses studies by Zwick (1973, 1980) and Nelson (1984). Stewart and Stark advocate Zwick's phylogeny over Nelson's which is more recent and modern, i.e., computer assisted. Their preference for Zwick's classification amounts to its being "the most complete" which may or may not be the most natural classification. They acknowledge, however, that none of the current plecopteran classification systems are completely satisfactory due to absence of a thorough analysis of both larval and adult characters.

The authors put a great deal of emphasis on the ecology and behavior chapter which includes many tables and graphs. This chapter specifically covers: life cycles and voltanism, egg development, nymphal growth and development, food habits, feeding, trophic interactions, habitats and space partitioning, secondary production,